Edgar J. Agnew

HOME-GYMNASTICS

FOR THE

HEALTH.

Translated from the German.

(Schreber)

LONDON:

HAMILTON, ADAMS, & CO.,

PATERNOSTER ROW.

Price Two Shillings and Sixpence.

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PREFACE.

THE Translator of the following little Work, himself a foreigner, having experience in his own person and in his own family of the inestimable benefits derivable from the practice of the Home-Gymnastics prescribed herein, feels impelled to an endeavour to make them more widely known in the land of his adoption than can possibly be the case so long as they remain in the German or Danish tongue (for it was in the latter he first made his acquaintance with them). He hopes that the many imperfections and shortcomings of his work will be excused by those who have felt the difficulty of finding adequate expression in another than their mother-tongue.

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CHAPTER I.

THE VALUE & IMPORTANCE OF GYMNASTICS FOR THE HEALTH IN GENERAL.

The human system consists of soul and body, combined in a wonderful, mutual, and cordial reciprocal action. The problem we have to solve consists in calling both into action, and in using both the bodily and the mental powers as equably as possible. The dull and indolent can never properly enjoy the material and intellectual blessings of life. Inactivity produces dullness in the bodily organs and derangements of the functions, accelerates disease and (ultimately) death, whereas a sensible use of the strength of the body enhances its own energy as well as that of the mind.

Every one acknowledges the truth of these observations, yet they are frequently neglected. Many concentrate all their energies on mental labour and study, and neglect the physical development of the body, a frequent error in the civilised and refined mode of living of the present day. Again, others like to enjoy, but object to contribute in any way towards securing these advantages. Nature does not allow any dictation in this respect, but judges and punishes the trespasser very severely. The use of the bodily strength demands as absolutely necessary a change of matter—the consumption and removal of matter—to maintain the body. Neglect in this respect is followed by a host of diseases. This has at all times been admitted by medical men, who have always advised bodily exercise, such as walking, riding, fencing, gardening, and the like. Though these exercises are healthy and to be recommended, they are still too uniform and unattainable by many, and are, therefore, insufficient. Many are compelled to confine their walking to fixed hours, and even this insufficient exercise has frequently to be abandoned. "Time is Money," is the watchword of the present; besides, mental development is far more required now-a-days than formerly; so nobody has time or inclination for taking a walk, which is generally called "waste of time." The distinction between walking and other powerful movements of the body is easily ascertained by comparing those who practise mountain-climbing for four or six hours daily, and those who inhabit towns, or who live in the country, and have but the usual exercise. The reason for the great difference in the structure of the bodies of the town-dwellers is particularly due to the non-action of the muscles of the arms, chest, back, and abdomen, which are all but entirely neglected.

An attempt has been made to find a remedy for this disproportion, both where the mental qualification has been developed at the expense of the body, and where the power for strengthening the development of the body and the energy of the life-functions has

been neglected, whether for want of time or other reasons. The gymnastics usually practised were fixed upon as being well adapted to develop the strength and to preserve the health. Our intention in this work is solely to treat of gymnastics which aim at curing (gymnastics for the sick) or for preventing disease (hygienic gymnastics). To both combined we give the name of gymnastics for the health.

It was a natural course to employ gymnastics for the sick, particularly against chronic diseases—not feverish—caused by want of bodily exercise: and experience soon proved that it might with success be employed against other diseases, not exactly derived from the same cause. Still, we must not go too far, and be induced to regard, like some enthusiasts, gymnastics as a wonderful universal remedy. Such a remedy does not and cannot exist, because the whole human organism is too complicated and its phenomena too manifold; but, when these gymnastic exercises are properly directed, and are not carried out in a one-sided manner, every unprejudiced observer must acknowledge them as an invaluable remedy, and as an important acquisition to the well-known methods of curing.

To be able properly to value these gymnastics for the sick in general, and to comprehend how the exercises of the body deserve to be called a remedy, it is necessary that we briefly describe the physiological importance of the muscles, and the part they play in the economy of the organism.

Organic life depends on an uninterrupted change of matter. That which is useless must be removed, and fresh organic matter reproduced, the materials being supplied by the food and the breath. The quicker and brisker this change of matter takes place, the heartier, more powerful, and more durable becomes the life itself and its activity. It is necessary that the constituent parts of the body be uninterruptedly renewed to make it thrive: any disturbances are in themselves, or produce, an ailing state, disease, and death. Insufficient consumption or insufficient discharge of the consumed matter—lack of balance between expense and receipts—is the general cause of insufficient development and progress of life. It is likewise the cause of an early decay, producing a lack of organic renovating power, which may be weakened by insufficient as well as by the exaggerated and exhausting use of strength and matter.

The muscle-system is quantitatively the largest of all the systems of the body, and the muscle-substance—the flesh—belongs to the organic tissues, which, in consequence of their natural activity, have most influence on the renewing of the matter, and require, therefore, that the general change should be carried on in the quickest, the most natural, and most complete manner. This change imparts to the whole process of life a natural start, renovates and renews the blood, and increases the whole energy of life. The blood is the source of the entire nutrition of the body, and the muscles act by their contraction on the blood-circulation, and on the formation and assimilation of the blood, and so in promoting digestion: also on the process of respiration and on all the excretions,—in short, on the activity of the

whole organic machinery. This activity accounts for an increased pulsation and strength of the heart, more powerful breathing, enhanced development of heat in the body; and by more powerful exercises an improved appetite, an increased secretion of perspiration and urine, together with sounder sleep, are secured—and the result of all this is a greater vital power, a greater endurance of all kinds of exertion, ability to withstand heat, cold, hunger, thirst, night-watching, and other vicissitudes, and, lastly, less susceptibility to prevailing epidemics.

It has been proved by physiological calculations that a person who judiciously exercises his muscles through about four or five weeks is, so to say, regenerated: the muscles acquire more firmness, more strength, and a greater expansion, and an unnecessary accumulation of fat is prevented.

When, in this manner, the activity of the muscles proves to be the natural factor in accelerating the removal of the useless and waste parts of the blood (which are inclined to remain in the body as a germ of disease), and in exchanging them for new and vital forces, it is easily understood how this activity will contribute to remove diseases originated from the same cause. We must not lose sight of the fact that a suitable change and regularity of the whole manner of living, and sometimes medical advice, is required, but the bodily exercises will always constitute an essential part of the cure. To the class of diseases now referred to belong principally the chronic disorders of the abdomen common at a ripe age, such as weakened digestion, constipation, costiveness, liver and spleen disease, hypochondria, melancholy, &c.; moreover, diseases caused by inappropriate assimilation of the blood, such as chloroses, glands, and others. We shall further on state some special diseases in which certain exercises will produce a direct benefit by the mechanical influence of the muscles.

Another physiological relation in this respect is the intimate intercourse between the muscles and the nerves, between muscle-nerves (movements) and sensation-nerves. Our bodily and mental health depends on their normal relation to each other. A complete equilibrium must necessarily exist between these two kinds of nerves: the one ought never to be developed at the expense of the other. The exercise of the muscles will produce a beneficial effect on too sensitive nerves, having a diverting and strengthening effect. On this account gymnastics constitute an excellent remedy against stiffness of the muscles, hypochondria, hysteria, mental derangement, pollutions, spasms, St. Vitus's dance, &c. They act likewise on low-spirits, especially if the proper exercises are performed with attention and interest. How much effect a firm will has on all nervous afflictions is well known.

We must not omit to state how much influence the activity of the muscles has on the firmness and strength of the articulation of the joints and altogether on each single movement and carriage of the body, for these depend entirely on the seat and structure of the muscles. This is particularly the case with the upper part of the body (the chest). Many diseases are solely caused by want of

space in the cavities of the chest and abdomen, where the most important organs for the health are situated: and this defect is specially found in those who do not exercise the strong arm-muscles, which are connected with the chest, and on which its form depends. The task is, therefore, to remove this defect, and a well-calculated gymnastic exercise will promote a cure better than any other remedy. To attain this end, with the assistance of the muscles, their expansion and contraction, we shall try to act, now on single parts, now on combined parts, as the chest. If anybody should entertain a doubt that an effect in this manner can be produced on the cavity of the chest (the bone-wall of the chest), we may state, as an illustration, that by continuing the exercises for some months, we have seen a person increase the circumference of his chest $1\frac{1}{2}$ to 2 inches, without counting the fleshy part of the muscles. The importance of such an augmentation of the cubical contents of the chest-cavity we hardly need to explain.

We have hitherto only mentioned gymnastics as a cure in particular respects. We are now going to prove how necessary a more general practice of hygienic-gymnastics is,—that is to say, that kind of gymnastics which is calculated to preserve the health and prevent disease, but not to cure. The necessity of this form of gymnastics is still more obvious, when we look at people who abstain from its exercise. It is evident that the sum and force of their movements are not only far below the average,* but that they are one-sided and unsatisfactory. In the general movements, such as walking, to which most of them are exclusively confined, four muscle-divisions are neglected, which have a considerable influence on the process of life, and the consequence of this neglect is a non-development of those muscles, and by-and-bye their decline. These four divisions are—1, the shoulder-muscles; 2, chest-muscles (these two for want of movements of the arms); 3, abdominal-muscles; 4, back-muscles (the two last for want of exercise of the body).

1 and 2. The muscles around the shoulders and chest are not only required to move the arms, but also rhythmically to expand and contract the walls of the chest; this constitutes respiration. The circulation of the blood in the lungs depends on the respiration. The blood in the lungs absorbs from the atmosphere those ingredients which chemically change and purify it, and the energy of the whole life-process is dependent on the force of this process. In defect of exercise in general, and particularly in defect of arm-movements, the respiration gets weaker and more imperfect. The elastic chest-wall is not fully expanded and developed, but becomes more and more contracted. Hence the germ of many diseases of the lungs (consumption) and heart, and likewise of derangements in the functions of the

* About four hours daily exercise, spread throughout the day, we consider as an average.

whole body (consequent on the insufficient supply of oxygen to the blood from the atmosphere). To absorb the required quantity of air, we must necessarily keep our respiratory muscles in full activity. When our respiration is healthy and strong, we are able to endure for some time air less pure, as we inhale a greater quantity of it, which supplies us with the necessary oxygen; but this is not the case with people of weak respiration.

3. The muscles of the abdomen, or lower part of the body, form the soft stomach-wall, which lies between the ribs and the hips. They are partly fleshy and partly sinewy, and are constituted by their power of contraction to strengthen the functions of the abdomen (digestion, secretion, delivery, &c.), as well as to secure and protect these organs against violence from without. They co-operate, moreover, in exhalation (speaking, singing, screaming, laughing, and coughing), and in various movements of the upper body. We may herefrom conclude how necessary it is to preserve the muscles from weakness and sluggishness, which, if permitted, must have the effect of checking and weakening the functions of the more internal organs; and how important these muscles are in hernia and in heavy confinements.

Digestion and respiration are the most important processes in animal life. The first extracts the blood from the aliments and the second improves and purifies it, that it may maintain the organic renewal and normal change of matter. This is the essential foundation of life and health, and these processes must be in reciprocal harmonic relation to each other, as well as to the whole organism. Hitherto sufficient attention has not been paid to the respiration and the development of the muscles associated with that process.

4. The back-muscles serve to keep the body straight and upright, to carry out the sideward movements of the body, and to assist respiration. Their development is, in many respects, of great importance, especially to keep the back straight, and likewise to facilitate, as much as possible, the functions of the chest and abdominal organs. When the back is distorted or bent, these organs must naturally suffer. The development of the back-muscles is especially necessary for the young, in time to prevent distortion. But it is also in other respects of great importance that the muscles should possess their full power, because—1st, The spine supports and carries the weight of the whole body, and consequently assists all its movements. 2nd, The muscles contribute without doubt directly to strengthen the spine, and so to prevent all diseases which have their origin in it. A healthy and strong spine is one of the most active preventatives against general debility, irritability, hypochondria, &c. When we look at the state of health of those who lack exercise, the truth of the above is obvious, and for the most part it is easily explained. The body never attains its complete development, when this exercise has been neglected at an early age; it is defective in appearance as well as in form, and in its functions it never attains the full flower of youth. Poor blood and irregular assimilation of

the fluid produce a series of ailments. Serious diseases, particularly chest diseases, threaten the life in its development.

Riper age suffers from the lack of these exercises occasioned by the various circumstances of life. The strong-developed youth may well for a time resist and vanquish the evil attending upon this want, but as a rule it only lasts until the age of manhood is attained when all kinds of chronic diseases of the abdomen arise, hypochondria, melancholy, stiffness, spasm, congestion of the blood, gout, hæmorrhoids, asthma, &c., which belong to this period of life set in. Fortunate are they who in time pay attention to the precursors of these diseases, and try to check them. To prevent is easier than to cure. If we wait until the disease is present, we are often too late. The health is property confided to us, and it is our duty to watch and protect it from danger.

Such is, in short, a picture of life frequently seen, and presenting itself in many different shapes. We are not mistaken when we consider want of exercise, if not the only, at least the most essential cause of great misery. We recommend, therefore, hygienic gymnastics as a necessity for every one who does not take other exercise than walking. There may be a few who partly escape the consequences of neglect in this respect, but they may rest assured that they get old before their time, that their body becomes powerless, the limbs stiff, &c. In a sensible and regular way of living, 60 or 70 years will not produce infirmities, and it is not unusual to see men and women retain their full strength until their eightieth year —that is to say, when their muscles have been properly strengthened, and they have lived a regular life, even under unfavourable climatic conditions. Live moderately, be industrious and contented! That is the hygienic (health) philosophy; and it will create a happy old age. It is the same advice as that given by the ethical life-philosophy. Acquire control of yourself, your bodily and mental infirmities and defects. Go to the battle with courage—however old you may be, it is never too late—and constantly endeavour to attain the true (internal) liberty—that is, amelioration. In this manner you will be able, within the limit the Almighty has fixed for your earthly career, to advance from victory to victory, and so to reach the last goal conscious of having solved your life's problem in a worthy manner.

On the fulfilment of these two commandments, the hygienic and the ethical, depends the whole secret of the most difficult, but, at the same time, the noblest and most important art,—that is, the art to live rightly.

CHAPTER II.

THE IMPORTANCE OF HOME-GYMNASTICS.

The purpose of this work, as indicated by its title, is to describe a medical scientific home-gymnastic—*i.e.*, an exercise of the limbs according to a certain plan, without apparatus or assistance, and which may be performed at any time and anywhere. It does not quite embrace the whole field of medical scientific gymnastics, as in some instances (gymnastics for deformed people, for example), particular apparatus, provisos, and direct medical advice are required; the exercises have then to be performed in a place specially arranged for that purpose. The home-gymnastics, on the other hand, are so conspicuously suitable, that in most cases, they will satisfy the demands of medical science, and frequently attain results only expected from the special medical gymnastics.

We must bear in mind that few people have the means to undergo a course of gymnastics in an establishment, whereas these home gymnastics, if performed inside or outside the house, do not require special assistance (as in the Swedish system), but may be carried out according to personal convenience. They may, moreover, be of great advantage to those who have passed a methodical course of gymnastics in an establishment, as a subsequent exercise in continuation of certain rules.

The purpose of this work, therefore, is to give an intelligible direction how to employ the exercise indicated, so as to prevent numerous sufferings and diseases, to develop the strength of the body, and to preserve health and vigour to old age, a direction equally useful to medical men and patients, to parents and teachers,—in a word, to bring home to everybody that he has in himself a remedy which, under nearly all circumstances, will be applicable and beneficial.

That the general and natural movements of the body may be able to act advantageously upon the health, it is necessary to collect them into a system, and to consider the essential physiological bearing of each. Only in this manner will it be possible to understand the practical advantage to each individual of selecting for himself what in each case would be most suitable.

This result is not attained by selecting the movements arbitrarily; it depends rather upon which movements are chosen, how they are performed, for how long a time, and how frequently repeated.

A system of this kind is suitable for patients suffering from chronic diseases, and for whom the medical adviser has prescribed bodily exercise—often conveying a very undefined and confused notion. For example, those who are drinking waters or are undergoing a course of baths may hereby take a lesson how to employ gymnastics in an appropriate manner—an absolute necessity in many

cases for the attainment of a favourable result, and which sometimes may save the necessity of a repetition of the course. The general and constantly recommended exercise, walking, is no doubt healthful, especially when the air is fresh and the locality picturesque, and where the eye and the mind are recreated and refreshed; but it is not sufficient. That exercise is not only too uniform, and, in certain cases, not always advisable, but it must be frequently prevented by wet or sultry weather, and it is often impossible for people who cannot endure walking. The gymnastic course, with its well-adjusted movements, prescribed and fixed for each particular case, makes amends for these inconveniences.

We are of opinion that even those who are able to take regular walks would only be doing justice to themselves by performing daily a suitable gymnastic exercise, as well in consideration of their health in general, as specially to promote digestion and the secretion of the large quantity of fluids imbibed.

To solve the problem we have entertained in composing this work, we have endeavoured to give a review of all possible medical gymnastic movements capable of being performed without apparatus or assistance, and under any circumstances. We have adjusted the movements anatomically and according to the active muscles in the body, by which the primitive form of the numerous every-day movements are performed. Every one will be able to judge of the beneficial influence of each single movement on the organism; and, with regard to the working-classes, they will likewise be able properly to judge how far the uniform movements of their labour may act injuriously on their health, and how certain indicated exercises may prove an antidote to such influence. It is easy to find movements which fatigue the body, but the question here is to select exercises which in every respect develop the body, reanimate its functions, and, at the same time, produce certain sanitary effects. These ought to develop the body more completely, and impart to it agility, strength, and endurance (the foundation of every other system of bodily training, military drill, dancing, &c.), and so preserve the bodily vigour until advanced age.

As the methodical home-gymnastic may be performed everywhere, and is suitable to all conditions, it is the surest method of attaining the indispensable harmony on which the higher civilisation depends; and mere general bodily exercise cannot be substituted for these gymnastics. The system may be recommended to all, even to those who have what is commonly called exercise enough, to preserve the free movements of the limbs in every direction. If we do not avail ourselves of all the blessings with which Nature has endowed us, but leave them unheeded and unemployed, we commit a sin against our Creator, which will certainly avenge itself.

It may be advisable, in some cases, to consult a medical man when the aim is to cure a certain evil, and, with his assistance, to select the proper exercises. It is our intention that this work should serve the medical man as a guide for those patients who may consult him, but we have also composed it in such a manner that the medical man's

intimation may be sufficient for the patient. When the intention is the general preservation of the health, medical advice is not required. By referring to the printed instructions, the most indefatigable business man—and he and students, clerks, and all whose occupation is sedentary, are most in want of bodily exercise—will be able to find an opportunity to perform the necessary exercises. They may be effected by the sacrifice of a quarter or half an hour daily, and they will do more good than several hours' walking. Health-gymnastics at home are indispensable for those who have not much exercise, and especially in the unfavourable seasons; by that want, the germ of many a disease of the organism is laid, which, sooner or later, will develop itself. Even the unfortunate one who, by the loss of a limb, lameness, or the loss of sight, is prevented from taking the necessary exercise, may be able, in his room or on his bed, to move his healthy limbs in the manner indicated, and in this manner to divert the danger arising from inaction. The same may be said of those who, from one cause or another, are confined to their room, and feel the want of exercise. How great a number of ladies do we see who, without being really ill, are constantly ailing! They would regain their health, if they would only take regular and suitable exercise, but though the medical man may constantly advise it, his advice frequently proves abortive, in consequence of numerous domestic and conventional obstacles, to which men are far less exposed.

The object of this work is to remedy these wants and needs, and the plan is laid accordingly.

To make all the movements more comprehensible, we have, in every instruction, indicated its proper application and the essential benefit to be derived therefrom. This will be sufficient in every case to admit of a proper selection being made.

CHAPTER III.

GENERAL RULES FOR HOME-GYMNASTICS.

1. The following athletic exercises are suitable for persons of both sexes, and in all and every condition of life. The few exceptions will be mentioned at the proper places, and the necessary modifications will be pointed out as far as possible. Pregnancy is under all circumstances to be considered as an exception, as well as any form of fever or inflammation.

2. The exercises must be continued with great perseverance, particularly in cases of sedentary occupation. They must be done at fixed hours, which is the only way to attain a successful result. Everybody ought to make this small sacrifice for the benefit of his health, even if he finds his occupation rather tiresome.

3. The time most suitable for the prescribed exercise is shortly before the ordinary meals—viz., before breakfast, dinner, or the evening meal, leaving off a quarter of an hour before eating, that digestion may have its proper course. The abdomen must not be overcharged at the time. The periods for exercise above indicated are preferable to any other, as being the most regular.

4. The tight fitting of garments must be avoided, particularly round the neck, chest, and abdomen.

5. The exercises must be selected and carried out under the supervision of a medical adviser, if there is any inclination to congestion of the internal organs, hæmorrhage, hernia, or any disease of the vital organs. In all these cases, rule No. 6 must be rigorously observed. Those who suffer from hernia must only practise when the rupture is held properly by a truss.

6. If the breathing and beating of the heart become more rapid by a single exercise, rest is required to allay this increased action before commencing the next.

7. The interval between the exercises should be employed (provided there is no cough) in practising prolonged breathing, making a deep inspiration, as in yawning, and continuing the respiration as long as there is any breath left in the lungs. During this process the hands are placed on the hips, to lessen the weight of the shoulders. This breathing exercise is one of the most important and most useful. It promotes a perfect development of the lungs, their liberty of action and healthfulness, while it has an immediate effect on the circulation of the blood (particularly in the abdomen). This breathing exercise, if performed daily, will extend the lungs, benefit the ordinary respiration, and so strengthen and exhilarate the whole organism. Hence, it is particularly recommended to those who have too little exercise. Persons who generally omit to develop the muscles of the arms and chest breathe, for the most part, only to the

extent of half the natural capacity; a portion of the cells of the lungs are not replenished with fresh air, and so become, in the course of time, weak. This accounts for frequent pulmonary inflammation in youth and manhood, and asthma in old age.

8. The exercises must be carried out not hurriedly, but with ease, and with suitable pauses between each, yet, at the same time, with the full power of the muscles, and precisely in accordance with the following engravings and regulations. Every exercise must be uniform and regular, which will only be attained by practice.

9. To obtain the desired result, it is in every case important to secure a proper degree of exercise. At the commencement a little exertion will satisfy, which may be increased gradually. In the description of each exercise, and the special instructions respecting it, we will try, as far as possible, to indicate an average scale, neither too large nor too small. Two conditions must be continually kept in view—(*a*) That a certain fatigue is felt, which, however, disappears by a little rest; (*b*) that the muscles do not experience any soreness; a painless sensation that the muscles have been brought into play, generally felt by beginners, proves by its salutariness that the exercise is natural and harmless.

Both these conditions ought to be considered as a limit which must never be exceeded, least of all by beginners. If at the commencement, in spite of every precaution, acute pains should arise in the muscles (which may often happen, even by insignificant but unusual movements), it will be necessary to allay them, and recommence with less exertion. By perseverance, double or treble the amount of exercise will easily be endured. The inconvenience and fatigue experienced at the beginning must not deter any one, or make him believe that the exercises are impossible, but rather encourage him to continue with an adequate exertion. The old but rejected maxim that "much does much good" must be guarded against, but when the bodily activity, which is increased by the movements of the muscles, corresponds with the nutrition—that is, the reproduction—we have a guarantee of having benefited the health by these exercises. Any excess of this limit will produce the reverse effect. By over-exertion the muscles get stiff and strained, and unfit for their appointed functions. Instead of raising the vital powers, it creates exhaustion, debility, and retrogression. Those who suffer from any kind of chronic disease ought to avoid violent and rapid motions, which it is, in fact, almost impossible to make in cases of that description. Gymnastics practised at regular hours, and in a right manner, will surely by degrees bring about the required result. A proper connection between activity and rest is, after all, the essential foundation of a successful result to all our organs and functions.

10. If, after having practised for some time, an increased strength of the muscles is perceptible, the activity of all arm-motions may be augmented by using dumb-bells of from 2 to 6 pounds, of course by degrees and without over-exertion.

11. It is advisable, even in the middle of winter, to open a window in the room where the gymnastic exercise is performed, to admit fresh

air; still, for those who suffer from chest-disease, it is to be considered if the air from without is suitable or not. In any case, the air must be thoroughly wholesome.

12. With regard to the diet, every one must take his own condition of health into consideration: but plain and frugal living is in every case recommended. Over-charge of the stomach is to be avoided, and all spirituous beverages must be taken moderately.

13. In case of indisposition, the exercises are postponed only when the health is thoroughly affected. Even at the time of menstruation, the exercises are not entirely left off: they are modified, according to the rules hereafter indicated.

CHAPTER IV.

RULES FOR EACH EXERCISE.

In the following description of the exercises it is notified how often every single movement is to be repeated. This is done by three figures—the first serves for the beginner, the second after a fortnight's practice, and the third after two months. The last number is to be continued, and not exceeded. The scale is calculated for adults.

For people above 60 years of age, for very corpulent persons, for those who suffer from feeble muscles, and for women and children, half the numbers indicated will be a proper proportion.

In cases where these exercises are used to remedy a certain and definite ailment, the number of movements may be increased, but, as a rule, the highest figure must not be exceeded. Many will only reach the second figure, and there are those who will not be able to advance so far. Whether the exercises are to be practised more than once daily depends partly upon circumstances, and partly whether the person himself finds it necessary.

If the exercises are used for any length of time against a certain ailment, it is advisable to repeat them twice a day, particularly those who suffer from plethora, or any kind of mental malady to which these gymnastics are especially applicable. In many instances, as in those of irritable constitutions, or those who experience continued pain in the muscles, it would be suitable to divide the practice into three or four parts in the course of the day, but the last must be at least two hours before bed-time.

The above observations tend to the production of harmony in the movements and their results: experience will, no doubt, assist in the selection of the proper movements, and help in determining how frequently they ought to be repeated.

Fig. 1.—Turning the Head in a Half-circle (10, 20, 30 times).

Fig. 1.

The head is to be turned in a half-circle from right to left, and as many times from left to right. This circle is to be made as large as the joint of the throat will permit, the body at the same time to be kept immovable.

Fig. 2.—Turning the Head Sideways (6, 8, 10 times in each direction).

Fig. 2.

When the joint of the throat is unfettered, the turning forms about a fourth part of a circle, so that the cheek is nearly above the shoulder.

Both these movements bring all the muscles of the throat and the neck into play, and make the joint of the throat easy and movable (provided there is no organic defect). They are thus particularly applicable where stiffness of the throat and neck muscles has set in, and in cases of nervous vertigo. The last-named disease will soon be removed when the head gets accustomed to turn in all directions. If there be a strong inclination to vertigo, it is preferable to do the exercises in a sitting position.

Fig. 3.—Raising of the Shoulders (30, 40, 50 times).

Both shoulders are raised simultaneously as high and with as much force as possible, but are lowered slowly, otherwise the exercise will greatly affect the head.

This movement brings into play the muscles, which not only raise the shoulders, but directly and indirectly raise the upper ribs; it contributes also to expand the upper part of the cavity of the chest, and may be recommended in the first symptoms of a pulmonary

Fig. 3.

disease, which it is well known first attacks the point of the lungs, and from thence descends to the tissue of the lungs. This movement has a direct curative power on lameness* in the muscles used for raising the shoulders. When one of the shoulders is more elevated than the other, which may have its origin in a partial lameness or in a curvature of the spine, this movement must only be practised with one shoulder, the lower, until the disproportion is removed.

* By lameness is understood not only the entire immovability of the shoulders, but the various states produced by disproportion of the muscles which ought to operate simultaneously.

Fig. 4.—To turn the Arms in a Circle (8, 10, 12 times).

The arms are stretched and made to describe a curve as large as possible, from front to back, and *vice versâ*. The arms must pass the head as close as possible. This movement requires an easy and free mobility of the shoulder-joints, by many only attained by practice.

The movement brings into play all the shoulder-muscles and all muscles resting on the cavity of the chest. The principal effect produced is, that the shoulder-joints become easy and flexible, the

Fig. 4.

respiration more powerful, which naturally causes a mechanical expansion of the chest. Consequently this movement is serviceable in an obstruction in the shoulder-joints, in a faulty structure of the chest (the foundation of asthma), and in pulmonary tubercles,—in short, in all cases where the object is an improvement of the respiration.

Fig. 5.—Raising the Arms Sideways (10, 20, 30 times).

The arms are stretched by the side without bending the elbows, and are then raised outward as high as possible. When the shoulder-joints are free and easy, and the muscles well expanded, the forearm must touch both sides of the head at the moment when they are stretched as high as possible.

The muscles for raising the arms and the neck muscles on both sides are particularly active in this movement. The walls of the

cavity of the chest and the spaces between the lower ribs are greatly enlarged, effecting a fuller respiration. This is particularly beneficial

Fig. 5.

to asthmatic people and to those who, after an inflammation of the lungs, suffer from a contraction of the lung-sac; likewise in case of lameness in the above-named muscles.

Fig. 6.—The Elbows bent Backwards (8, 12, 16 times).

Fig. 6.

Both hands are placed firmly on the hips, and the elbows, in this half-bent position, are made to approach each other on the back as

closely as possible. The back must be kept quiet. The point of this movement is the backward bending of the elbows, which must be performed while inhaling the breath.

Fig. 7.—Folding the Hands on the Back (8, 12, 16 times).

While the back is kept straight, the hands are placed behind and high up, where they grasp each other. The arms are then stretched downwards until the elbows are entirely straight, the last part of the movement to be performed whilst inhaling the breath. By both movements the shoulders are drawn back with force, and by the last

Fig. 7.

they are also drawn downwards, both of which have an influence on the whole bearing of the body. The foremost chest-wall is mechanically enlarged, and the respiration becomes more powerful.—in short, they provide against a bad carriage and inability to keep the upper part of the body erect; furthermore, they are beneficial in most cases of chronic asthma.

Fig. 8.—Strong Inhalings on one Side of the Lung (6, 8, 10 times consecutively, and repeated 3 or 4 times daily).

The purpose of this movement is to endeavour to remedy a disproportion in the action of the lungs, and therefore it is only suitable in cases where the respiration is not identical on both sides—that is, when the respiration is less active on one side than on the other, it may be in consequence of a faulty structure of the cavity of the chest, lameness of the chest-muscles on one side, or some defect in the organs—as a contraction of one side remaining after a disease.

The palm of the hand is placed on the healthy side of the chest as

high up as possible, and under the hollow of the arm, and is tightly pressed on the ribs, to prevent a too great expansion of this side; while placing the other arm above the head occasions more space in the corresponding part of the chest on the other side, and therefore forces it to a more powerful inhaling. The hand that is placed on the ribs must apply the pressure during the inhaling, which

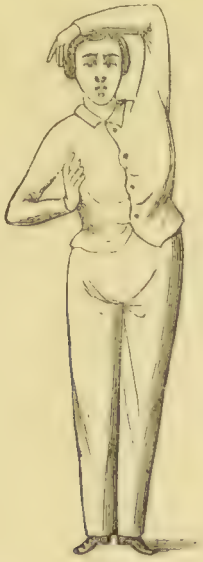

Fig. 8.

has to be done as powerfully as possible, so as to fill the chest with air. This movement must be carried out with ease and regularity, as in yawning. All hurry and irregularity must be avoided. These inhalings may serve as substitutes for the respiratory exercises mentioned on page 18, still without entirely neglecting the latter.

Fig. 9.—Movements of the Arms: forwards (10, 20, 30 times).
„ 10. Do. do. sideward (10, 20, 30 times).
„ 11. Do. do. upwards (4, 8, 10 times).
„ 12. Do. do. downwards (10, 20, 30 times).
„ 13. Do. do. backwards (6, 10, 16 times).

These movements constitute a powerful bending and stretching of the arms at the elbow-joints, in five attitudes. They are carried out with clenched fists, and with full play of the arm-muscles; the bending and stretching to be made with equal force, yet not so forcibly as to shake the whole body.

The muscles for stretching and bending the forearm play the principal part in this exercise; the chest and shoulder-muscles are likewise

active, so that the whole of the muscles of the upper extremities are more or less brought into play. These movements are therefore to be recommended for strengthening the arm-muscles, to increase the

Fig. 9.

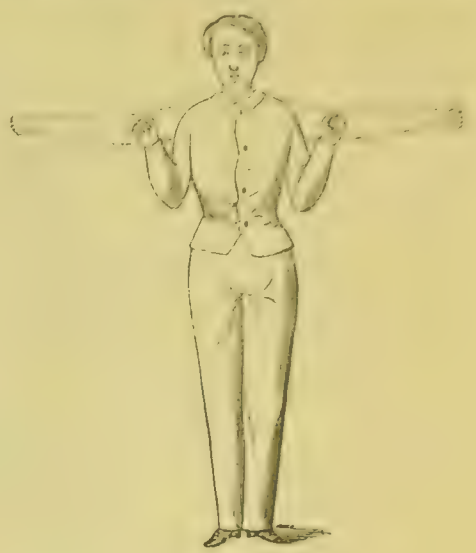

Fig. 10.

Fig. 12.

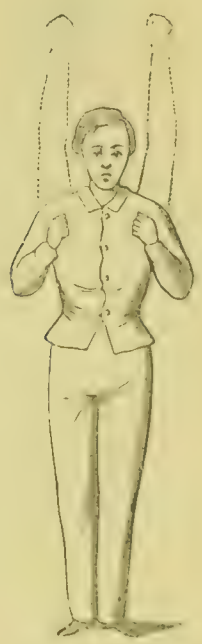

Fig. 11.

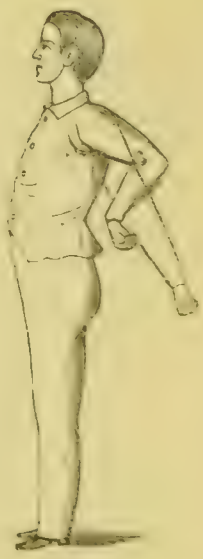

Fig. 13.

activity in the shoulders and elbow-joints, to overcome inactivity of the muscles and muscular rheumatic pains, and lastly, to strengthen the process of respiration.

Fig. 14.—Stretching the Arms Sidewards (8, 12, 16 times).

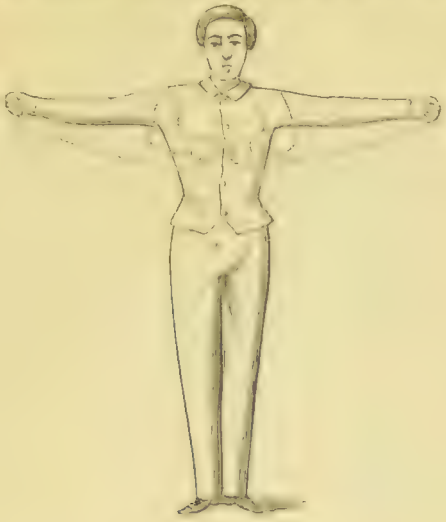

Fig. 14.

The stretched arms are drawn together in a horizontal line, but without the hands touching each other. The moment of the convergent movement is the point in this exercise.

Fig. 15.—Stretching the Arms Forwards (8, 12, 16 times).

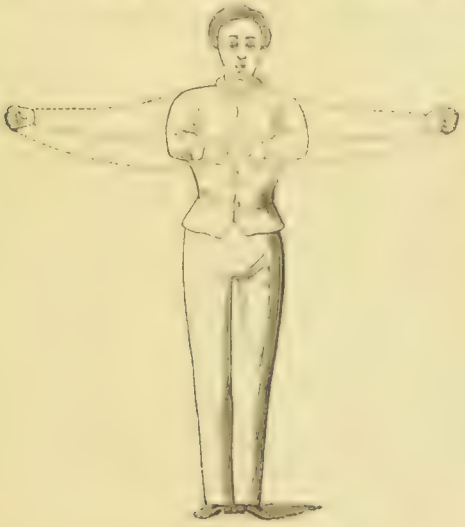

Fig. 15.

This exercise is the same as the preceding, only in an adverse direction. The point here is the moment of the divergent movement.

Both these movements produce an alternative activity in the foremost chest-muscles and the hindmost shoulder-muscles, while the fore-wall of the chest-cavity is first and the hinder-wall is soon afterwards enlarged.

This exercise is useful for strengthening the respiration, in asthma, lung tubercles, and contraction of the lung-sac.

Fig. 16.—Turning the Arm on its own Axis (30 40, 50 times).

Fig. 16.

This movement is synonymous with that of boring a piece of wood with stretched arms. All the arm-muscles are hereby brought into play.

Fig. 17.—Imitating the Writing of the figure ∞ (20, 30, 40 times).

Fig. 17.

This movement is like writing with the hand a recumbent figure ∞. All the muscles of the hand are brought into play.

The same movement may be made with the arms alternately. The effect will then be the same as in swinging the arms.

Fig. 18.—Spreading and Stretching the fingers (12, 16, 20 times).

The fingers are stretched and spread with as powerful an impulse and as far from each other as possible: then the hands are clenched. This brings all the finger-muscles into play.

The three last movements (16, 17, 18) serve to strengthen the joints of the arms, hands, and fingers, and so counteract the first symptoms of stiffness (particularly gout) in the joints, in various kinds of cramp, as St. Vitus's dance, and cramp from writing.

If they are used as a remedy against a certain indisposition, they may be repeated three or four times daily, provided the exercise does not leave any pain: and finally, this movement may serve to divert congestion of blood in the head.

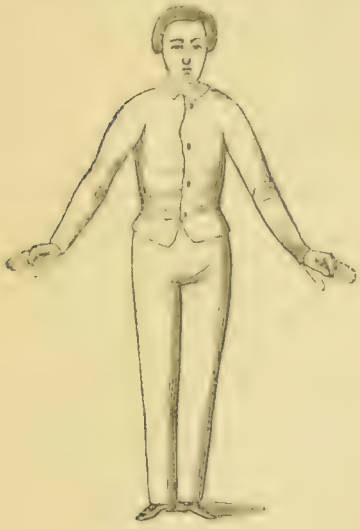

Fig. 18.

Fig. 19.

Fig. 19.—Rubbing the Hands (40, 60, 80 times, forwards and backwards).

A practice well known. When the hands are pressed tightly together, the movement becomes more powerful, while the arm-muscles, particularly the muscles used for bending and the foremost chest-muscles, are likewise brought into play. To be recommended in cases where a powerful movement is intended against weakness in some of the muscles, and particularly adopted for quickly warming the hands, and when combined with the foot-movements hereafter mentioned, will assist to divert the blood from the head. The same movement may likewise serve as a diverting remedy against a too rapid flow of blood to the internal chest-organs.

As these movements affect the chest-muscles, a too powerful pressing of the hands in the last case is to be avoided, but just to rub the hands gently. It may, however, be repeated 1 to 3 times daily.

Fig. 20.—Bending the Body Forwards and Backwards (10, 20, 30 times).

While resting firmly on the well-stretched legs, kept close together, the upper part of the body is bent forward and backward, as low down as possible. This, as well as all the following movements of the upper part of the body, must be carried out in an easy and even manner. The movement forwards is executed by the forement straight ventral muscles—that is to say, those muscles which, in the front part of the abdomen, pass from the top downwards. The movement backward is executed by the muscles of the back used for stretching. The result obtained is a regular pressure on the organs of the abdomen, by which a sluggishness in the functions of the organs is prevented, consequently obstructions, &c., besides weakness in the lower back-muscles.

Fig. 20.

Fig. 21.

Fig. 21.—Bending the Body Sidewards (20, 30, 40 times).

The upper part of the body is bent sideways, from right to left, and *vice versâ*; any kind of hurry or exertion of force to be avoided. The movement is executed by the side-muscles and the hindmost-muscles of the abdomen, and partly by the muscles between the ribs. It acts beneficially on the circulation and on the functions of those organs placed on both sides of the abdomen, especially on the liver and the spleen, and may, therefore, be recommended, particularly in all diseases derived from stoppages in the system of the portal vein.

Fig. 22.—Turning the Body on its own axis (10, 20, 30 times, forward and backward).

The upper part of the body is kept straight, and is turned to both sides on its own axis, the legs well stretched and kept together. This movement brings particularly the back and hip-muscles into play. The foremost wall of the abdomen becomes mechanically expanded and enlarged towards the reverse side of the turning, by which the bowels are, so to say, moved forward and backward, as if they were kneaded. The result is a reanimation of their function, and a removal of any weakness in the named muscles.

Fig. 22.

Fig. 23.

Fig. 23.—Turning the Body in a Circle (8, 16, 30 times).

The upper part of the body is hereby turned on the hip-joints, and describes a funnel-shaped curve from right to left, and as frequently from left to right, the circle to be made as large as possible. In every position of this movement the head is to be kept straight; in this way, the body does not turn on its own axis. The movement brings into play all the hip-muscles, in which movement the abdominal muscles alternately partake. It produces a thorough animation of the whole digestive apparatus, and may, on this account, be recommended in all kind of sufferings created by the sluggishness and inactivity of these organs. If the exercise is used for the purpose only of promoting a motion of the bowels, it is preferable to do it on one side only, so that the half back-part of the curve described by the head and upper part of the body is only turned from right to left. The regular and rhythmical expansion of the abdomen-muscles in this manner contributes to push down the contents of the rectum. This exercise may likewise be useful in weakness of the hip-muscles; and by the movement of the head and upper part of the body, it will serve as a remedy against nervous giddiness. If the last-named evil is prevalent, the exercise must be carried out in a sitting position.

Fig. 24.—Bending the Body Upwards (4, 8, 12 times).

The body must be stretched horizontally. If a bed or sofa is not available, a folded carpet or a pillow under the head and hips may be used.

The movement consists in raising the body straight up, while the legs are kept immovable. Very few will be able in the beginning to carry it out without a counterpoise to the legs, or keeping them under a heavy or fixed piece of furniture. At the beginning the arms may be crossed on the chest. If this proves successful, the arms are gradually removed to the sides or to the back of the head, as indicated in the figure; even dumb-bells may be used, which are to be kept close up to the body.

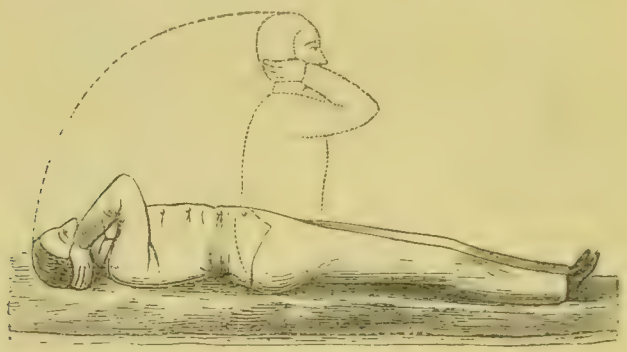

Fig. 24.

This exercise has a great effect on all, and particularly on the foremost abdomen-muscles, which have an immediate influence on the functions of the abdomen. After performing this exercise 6 or 8 times, a beneficial effect is discernible, by the pleasant sensation of heat which is diffused over the whole region of the stomach. It may therefore be justly recommended for weakness or stiffness in the muscles of the stomach, for all kinds of chronic pains in the abdomen, obstinate constipation, piles, flatulence, &c. A radical cure of rupture in the abdomen may be effected by this exercise.

If, in spite of the support mentioned to the feet, the raising of the body cannot be attained, and in cases where a different proceeding is necessary—as in hernia, and by women who, in consequence of frequent confinements, have the abdomen-muscles relaxed—it is desirable to place the upper part of the body in a little more elevated position. If the support giving this elevation be reduced by degrees, the proper result will no doubt be attained. A common sofa or couch would here be suitable.

Fig. 25.—Describing a Circle with the Legs (4, 6, 8 times with each leg).

With the fully stretched leg a curve from front to back is described as large as possible, the leg being raised to the full extent. When

the curve is done the foot is replaced, and the same movement is made with the other leg, the body to be kept as quiet as possible. As the centre of gravity of the body each time is somewhat displaced, a very complicated play of the muscles is attained, not only those

Fig. 25.

muscles which raise and move the leg, but all the lower muscles of the upper body, especially those of the back, are brought into play. The hip-joint is hereby made more pliable, particularly where rheumatism has produced stiffness. This movement must not be exercised as long as any trace of inflammation is discernible.

Fig. 26.—Raising the Leg Sidewards (6, 10, 16 times with each leg).

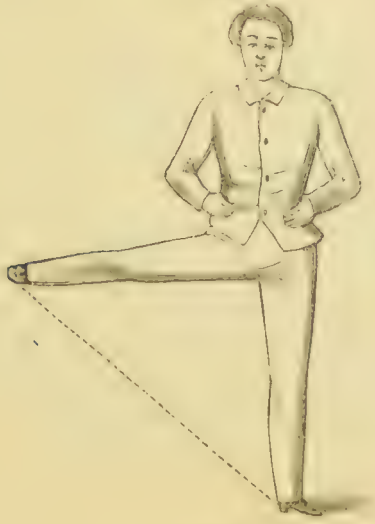

Fig. 26.

The leg to be stretched and lifted sidewards. To make the movement as complete as possible, the stress is laid on the lifting, still without any violent exertion, and, as in the previous exercise, each leg in turn. This movement is carried out particularly by the hip and abdominal-muscles. The result is the same as that from the previous movement, only that, by the more powerful influence on the regions of the liver and spleen, it will have a beneficial effect on pains caused by sluggishness in the portal vein-system.

It is not to be practised by women.

Fig. 27.—Turning the Leg on its own axis (20, 30, 40 times with each leg).

The leg, stretched and slightly raised from the ground, with upturned toes, is energetically turned outward. It is on the outward movement that the stress is laid and the strength employed. The movement becomes easier, more exact, more complete, when each leg performs its given number of times without changing. The effect is the same, but in a slighter degree, as that of No. 25.

Fig. 27.

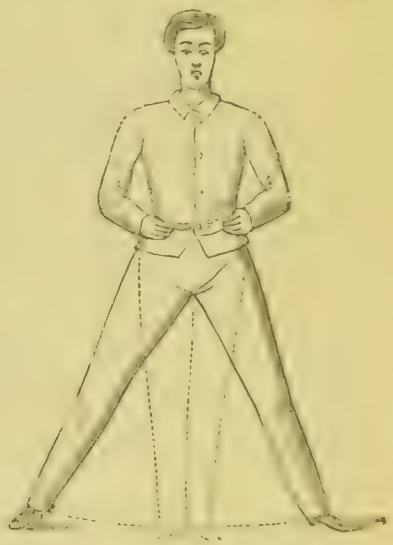

Fig. 28.

Fig. 28.—Drawing together the Legs (4, 6, 8 times).

The legs are raised on tip-toes and spread out sidewards, then drawn together by sliding along the floor, without bending the knee or raising the feet. It may be performed by moving each leg a little in succession, until they ultimately meet. By resting on the soles of the feet, the legs may be moved simultaneously without changing.

This movement strengthens to a great extent the muscles of the inside of the thigh and those of the calf: consequently, it is to be recommended for weakness in the mentioned muscles, and to serve as a remedy against congestions of the head and chest.

Fig. 29.—Knee-bending and Stretching the Leg Forwards (6, 8, 10 times with each leg).

The leg is raised and energetically bent at the knee-joint, kept steady, still with strained muscles, then stretched out, each leg in turn. Great activity is produced in most of the muscles of the legs and feet used in stretching and bending, and likewise in those of the pelvis. The knee-joint is made more elastic, and it cures stiffness in this part. If the movement causes any pain, it must be abandoned. In any weakness of the muscles it acts invigoratingly, is very useful against blind piles, as it promotes the circulation of the blood in the abdominal organs, and relieves the upper parts of the body.

Fig. 29.

Fig. 30.

Fig. 30.—Stretching the Leg and Bending the Knee Backwards (10, 12, 16 times with each leg).

In consequence of the anatomical structure of the hip-joint, the leg cannot be stretched as far backwards as forwards. The upper body is kept straight, and the leg is stretched backwards as far as possible, the knee bent energetically, and the leg is again stretched. The movement is easier performed by exercising each leg several times, instead of in turn.

Likewise here the leg and foot-muscles for stretchingand bending are brought into play, only in a reverse sense, as in the former movement. The lower muscles of the back are likewise active.

By this, as well as by the foregoing movement, all the muscles of the lower extremities are brought into play, and the knee-joint becomes more flexible. It is to be recommended where the spine and foot show symptoms of weakness, and against the former it serves as a relief.

Fig. 31.—Stretching and Bending the Foot (20, 30, 40 times with each foot).

The completely stretched leg is raised a little forward. In this position the toes are moved upward and downward. Only the foot-joint is to be moved.

At the same time, all the toes are energetically bent and stretched; easy-fitting shoes are necessary. This movement may be exercised in turn with a circle-shaped movement of the toes, or with that of the Figure 8, as mentioned in No. 17. The shin-bone and calf-muscles, as well as those on the foot, are brought into play. The foot-joints and the toes attain a greater flexibility. It is, therefore, to be recommended against weakness and stiffness in these parts: it serves likewise as a prompt and sure method of keeping the feet warm.

This exercise may be performed in a sitting position, as when compelled to sit still, or with wet feet, when driving, or in a cold locality. If this movement is repeated 50 or 60 times every quarter of an hour, it will act as a safe preventive against the usual results arising from cold and wet feet.

Fig. 31.

Fig. 32.

Fig. 32.—Lifting the Knee in Front (4, 8, 12 times with each leg).

The leg is bent at the knee-joint, and raised as close as possible up to the chest. The point here is the lifting; the body to be kept as straight as possible, as there is an involuntary inclination to bend the chest forward. When the hip-joint is perfectly flexible, it will be easy, after a short practice, to let the knee touch the chest, by bending it slightly forward. This movement is, however, not to be forced, as it depends to a certain extent on the power of the muscles

and on the structure of the whole body how far it can be practised. It is preferable to take each leg in turn.

It is an active exercise for all the lifting muscles of the leg, and for those of the pelvis, as all the organs of the abdomen are mechanically called into action by pressure and counter-pressure. On this account it is beneficial to the functions of these organs, and is particularly recommended for inactivity and sluggishness in their functions, which are the cause of many chronic diseases specially based on inactivity of the portal vein-system, are enfeebled digestion (particular when indisposition and flatulence are felt an hour or two after a meal), in constipation, costiveness, and flatulence, against which this exercise is very active; are hypochondria, hysterics, checked hæmorrhoids, and checked menses, the so-called mucous bladder hæmorrhoids, chronic mucous flood of the sexual organs, &c. The exercise may likewise be used as a somniferous remedy. It must always be borne in mind that the effect of this movement is rather irritating, and it must, therefore, be modified and regulated accordingly. It is decidedly to be deprecated in cases where there is the slightest trace of inflammation or irritation of the abdominal organs, or of disposition to hæmorrhage and hernia. Those who are disposed to congestions, or are using chemical baths, may perform this exercise with great precaution, and with the permission of their medical adviser. Young ladies may only use it in exceptional cases.

Fig. 33.—To Squat on the Ground (8, 16, 24 times).

Fig. 33.

Raised on tiptoe, the heels close together, the body is let down as low as possible without separating the heels, the upper body to be kept as straight as possible. At the beginning it is rather difficult to keep the upper body in that position, as the balance is easily lost, and consequently, the upper body drops forward; but practice and attention will soon conquer these obstacles.

The knee-muscles for stretching, the calf-muscles, and the [illegible] play here a prominent part; the back-muscles are likewise very active in keeping the upper body erect. The movement contributes to make the joints more flexible, and is a capital remedy against weakness and inactivity of the lower part of the body and the lower extremities. As the respiration by this exercise is easily affected, it is necessary to make a short pause every three or four times. The author himself has tried, at an age beyond 50, to what extent this exercise may be carried out, if no other is used at the same time. Without any trouble or fatigue he advanced to 300 times in the course of 10 days, half the number in the morning and half the number in the evening, with short pauses. Although the author has plenty of exercise, and is endowed with muscular strength, having left off the exercise for some time, in recommencing it he experienced a soreness in the foremost thigh-muscles on the following day, after having repeated the movement 30 times. This shows how far the exercise must be modified according to the performer's capability.

In the following we shall bring forward a series of compound movements, where the activity is not concentrated in a single member or single part, but embraces at the same time several parts of the body.

Fig. 34.—Stick-exercises with the Arms (4, 12, 16 times forward and backward).

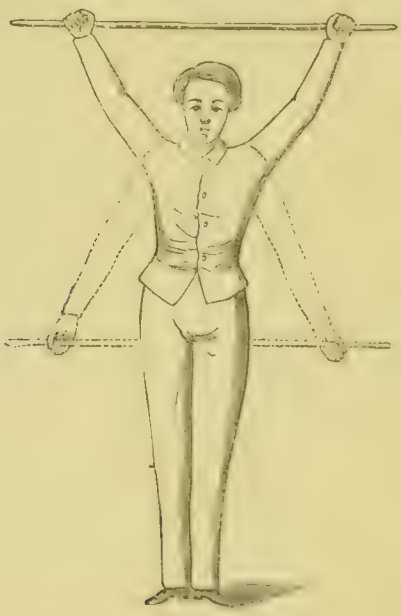

Fig. 34.

A round stick is required, in length from the ground to the arm-pit of the performer. It is grasped close to the extremities,

with the back of the hands turned upward, and while so held it is made to describe a vertical arch above the head, and it is then brought back in the same manner, so that the stick touches the front as well as the back part of the body. It is imperative to keep the arms stretched at the elbow-joints. At the beginning it is rather difficult, as most people lack the requisite mobility in the shoulder-joints, the use of which has to a certain extent been neglected. The exercise will by-and-by become practicable, and it will be possible gradually to approach the hands nearer to each other, until the distance between the hands, as indicated by the figure, is attained. To bring the stick backward and forward, the upper body is simultaneously bent, which causes the compound movement.

This exercise is principally calculated to act upon the shoulder-muscles, likewise on the stretching-muscles of the arms, and partly on the lower muscles of the back and the stomach. The shoulder-muscles are hereby made flexible and movable, the enfeebled muscles strengthened, the process of respiration is made more powerful, and the functions of the stomach reanimated.

Fig. 35.—Walking with a Stick under the Arms (10 or 15 minutes each time).

A short round stick is placed across the back, resting on the arms, which must be completely bent and forced back, and in this position

Fig. 35.

walking is practised, with the upper body as immovable as possible. The stick imparts a proper direction to the back, and keeps the arms

in a position which would otherwise be difficult to preserve for any length of time.

The object of this exercise is to strengthen the muscles of the back, shoulders, and feet, and likewise to give the body a proper and graceful bearing; consequently it is to be employed by those whose carriage is bent, unsteady, staggering, or ungraceful. It is especially recommended for children, who easily adopt an ungraceful carriage, which, while they are growing, may give rise to sad and lifelong consequences (as distorted spines, defective development of the chest-organs, &c.).

Fig. 36.—Swinging the Arms Backward and Forward (30, 60, 100 times).

The arms, well stretched and unconstrained, are energetically thrown backward and forward, if possible in a *tempo allegro*. The upper body is moved backward and forward on the hip-joints. To keep the balance the body is, as a matter of course, bent forward when the arms are thrown back, and *vice versâ*. The exercise becomes hereby easier, and the effect more extensive. The co-operative shoulder and arm-muscles are brought into a rhythmical

Fig. 36.

activity. It produces a healthy and complete motion, and assists in producing a healthier blood-circulation of the whole body; it may likewise contribute to cure certain cases of weakness in the arm, shoulder, back, and abdominal muscles, and act beneficially in cases of sluggishness and inactivity of the latter muscles. Altogether it is to be recommended at the beginning of these gymnastic exercises, as

it is agreeable, without being fatiguing. Though it produces a quicker circulation of the blood, it does not irritate, and may frequently be employed as a remedy for warming, specially the hands and upper body. It is furthermore to be recommended as a recreation and reanimation against low-spiritedness and depression induced by the weather or by season, or nervous complaints in the abdomen (as in hypochondriacs), in such cases the movement may be repeated 200, 300, or 400 times, with short intervals.

If an increased effect and a more constant motion of all the muscles in the upper body be aimed at, the movement may be carried out in such a manner that the arms do not go together, but are moved in opposite directions, the one forward and the other backward.

This modification may likewise serve to remove lesser distortions of the spine. Care must be taken that the stress of the movement is laid in one direction only, as by the left in the backward and by the right in the movement forward, or *vice versâ*, according to the character of the complaint. The last exercise must be directed by the medical adviser.

Fig. 37.—Swinging the Arms Sideward (30, 60, 100 times, backward and forward).

Fig. 37.

This exercise is similar to the previous one, and is performed in another direction only, by swinging the arms sideward instead of forward and backward.

The upper body is only bent enough to give room for swinging the straight downward-stretched arms in front of the body. Here, like-

wise, must the hip-joints give way a little, that the body may be moved sideward in opposite direction to the arms. In this exercise the foremost chest-muscles are very active: and instead of, as by the preceding movement, the stomach-muscles being called into play, here all the muscles of the sides are acted upon. Therefore this exercise affects principally the liver and the spleen, and assists to remove any inactivity and sluggishness in the functions of these organs. The back-muscles are at the same time strengthened by the bending of the body. Lastly, it possesses all the properties of the previous exercise, and may be employed in the like manner.

Fig. 38.—Sawing-movements.

The upper body is well bent, one arm is stretched forward and downward; while at the same time the other, bent at the elbow, is drawn backward and upward. The two are changed in this manner in turn. This movement is easily carried out by imagining that one arm is pushing an object, while the other is attracting it.

By this exercise all the muscles of the arms, shoulders, and back are brought into play, and it is well adapted therefore to produce a total effect against weakness in the mentioned muscles. As the organs of the chest and the abdomen are here active, it serves likewise as a remedy against derangements in the functions of these organs. It is particularly recommended as a remedy to disperse morbid gatherings, gland-swellings, &c., in the chest, or in the cavity of the abdomen.

Fig. 38.

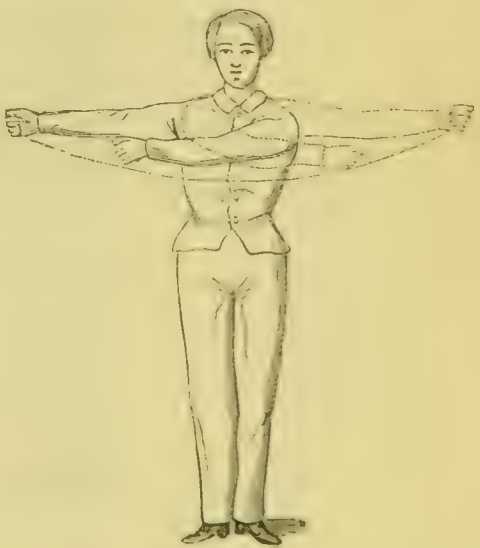

Fig. 39.

Fig. 39.—Mowing-exercise (8, 16, 24 times to each side).

The arms are stretched straight forward, and moved from one side to the other, and *vice versâ*, and form in this manner a half-circle.

The body and the lower extremities to be kept immovable. The stress of this exercise is laid on the swinging movement from right to left, and from left to right. It is just like mowing where the force is in the moment of the movement.

As the body makes a responding resistance to each swing, not only the arm and shoulder-muscles are brought into action, but all the muscles of the upper body, the pelvis, and the lower extremities are active. This exercise, therefore, revives the whole muscular system, and is principally to be recommended in cases where a general want of strength in the muscles exists by stiffness, and particularly at the vertsel of stiffness in the spine, when a certain heaviness and ususual unsteadiness is felt in the gait, which are in general the first symptoms to rouse the patient and frighten him.

Fig. 40.—Woodcutter exercise (6, 12, 20 times).

The legs are parted, and placed firmly on the floor. The stretched arms are then raised high up and brought down with force, as if a piece of wood placed between the feet were to be sawn. The knees must yield a little, to make the movement free, easy, and as complete as possible.

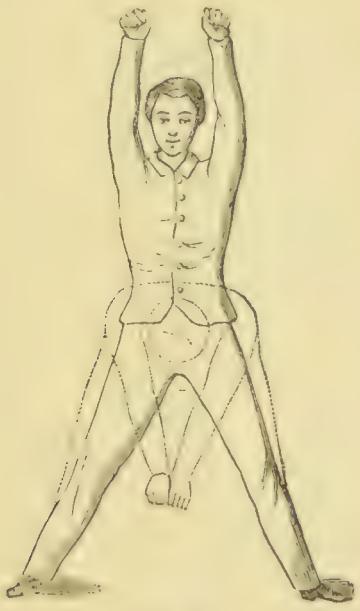

Fig. 40.

The lifting-muscles of the arms, the foremost and hindmost pelvis-muscles, and all the leg and foot-muscles, are hereby brought into action. On account of the peculiarity of this exercise, it is chiefly

adapted for curing two ailments—firstly, to remove sluggishness and inactivity in the functions of the abdominal organs, and, next, as a strengthening remedy for the spine-nerves when a stiffness has already been prevalent for some time. This exercise must, however, be modified according to the result in view. In the first case, to act upon the organs of the abdomen, the stress must be laid on the downward movement; and, in the second, at the moment of raising the upper body. If there be any inclination to congestion of the blood to the head or chest, this exercise had better be omitted, and it is altogether unsuitable for women.

Fig. 41.—Trotting on the Spot (100, 200, 300 times with each foot).

This exercise is the same as common trotting, but on the same spot without moving either forward or backward. It is not necessary to bend the upper body, and it is carried out on tiptoe only, and not on the sole of the foot, which would shake the whole body too much, and be injurious to those who suffer from congestion to the head.

Fig. 41.

The knee and foot-joints are kept flexible. It depends on circumstances how quickly and energetically the exercise is to be performed. This movement is particularly adapted for the following cases:—When only an easy and rest-inviting movement is intended; for example, to induce sleep, to promote the motion and blood-circulation in the abdomen, to divert the blood from the head and chest, or as a remedy against cold feet. As it promotes the circulation of the blood in the abdomen, and draws it downward, it tends to reopen checked piles and checked menses. Attention must be paid to some remarks in this respect, which will be made further on.

Fig. 42.—Leg-movements Forward and Backward (8, 16, 24 times with each leg).

Fig. 42.

Fig. 43.—Leg-movements Sideward (8, 16, 24 times with each leg).

Fig. 43.

One leg is raised about an inch from the ground, and moved with force forward and backward, or to the right and left. At the com-

mencement it may be necessary to rest the hand on a chair or table to keep the balance; but try as soon as possible to dispense with this support, as part of the effect is thereby lost. While care is taken to keep the balance and the body quiet, a complicated play of the muscles is produced, which is just the purpose of this exercise.

Both these movements are particularly adapted to call into action to a large extent all the muscles surrounding the hips, to act likewise on all the back-muscles, from the neck down to the pelvis, and on the muscles of the lower extremities. Even the muscles of the leg which is kept still are in activity, as there is plenty to do to keep the balance of the whole body. This exercise is, therefore, to be recommended against chronic, rheumatic, and gouty afflictions in the hip-joints when no inflammation is prevalent, and against weakness and stiffness in the feet, and, lastly, as a general exercise.

Fig. 44.—Stick-exercise with the Leg (4, 6, 8 times with each leg, forward and backward).

The tips of the fingers lay hold of a straight stick, the distance between the hands being equal to the breadth of the body. This movement consists in trying, in a forward bent position, to convey one leg after the other over the stick, but with perpendicular shin-

Fig. 44.

bone,—that is to say, when the leg is conveyed over the stick, the shin-bone is in a perpendicular position above it; the stick, of course, is not to be dropped. When both legs have been brought over, they have to be conveyed back again in the same manner. This movement is no doubt difficult at the beginning, even impossible for some, but, by continued exercise, nearly every one will be able to succeed.

Beside many secondary actions, the chief effect is concentrated in the muscles of the cavity of the abdomen, which are forced to the highest degree of contraction. This produces a powerful pressure on the lower part of the colon, particularly on the rectum and on the pile-vessels. The exercise ought, therefore, to be performed very regularly every day, against obstinate constipation, particularly in the lower part of the colon, and by the so-called hæmorrhoids. It must be well understood that no fever or inflammation must be present.

Indisposition of blood, congestions to the head, in hernia, and for ladies, this exercise must be strictly interdicted.

Fig. 45.—Rolling on the Back (30, 40, 50 times, forward and backward).

The body is stretched horizontally on its back, on a mattress or blanket, of the size of the upper body, and with a pillow beneath the head. The arms are then crossed and the knees half-bent, the heels being fixed to the ground. The whole body is rolled on one side, so as

Fig. 45.

to rest on the arm, shoulder, and hip, and then to the other, and so on. The body must each time be rolled over till it has got in a proper resting position, and describing a half-circle.

In this movement, which in itself is not very fatiguing, it is not so much the purpose to exercise the active muscles as to act on the internal and easily movable organs, especially those in the abdomen, which are hereby forced to shift their position. This change of site may mechanically obtain, or assist to obtain, a successful cure. This, for example, is secured by a quicker dispersion of the blood, where too large accumulation of blood is at hand, when the blood circulation in the more internal organs of the abdomen is checked by large piles when not inflamed, by the spasm thereby produced on the urinary bladder, or when a too powerful flood of blood is apprehended, in the approaching menses, in consequence of accumulation

or congestions of blood, and in some other cases. Also in accumulation of wind in the intestines (flatulence, and hence colic).

The object of this movement is not a radical cure, but only to alleviate, and it is not, therefore, to be used as an every-day practice, but it may be advantageously employed occasionally.

CHAPTER V.

SERIES OF GYMNASTICS FOR SPECIAL CASES.

In the following section we intend to bring forward a series of special instructions, in regard to cases of most frequent occurrence, that are best adapted for methodical gymnastic treatment at home; and we hope to give a comprehensible and safe guide to the selection of the proper exercises. The question here is to make practical selection of the various movements. It must be borne in mind that the instructions are only for anticipated afflictions, and must, therefore, be modified according to circumstances, which may require the assistance of a medical adviser. The best guide in selecting the proper exercises is each individual's experience of himself. We repeat here that the instructions given to attain a certain result are not to be looked upon as an infallible cure, but as part of a remedy for a certain affliction, which they will assist in a high degree in curing.

In the composition of the single movements named in these instructions, an appropriate variation in the activity of the muscles has been well considered. All over-exertion must be avoided, and the identical muscle-exercises must not follow too close upon each other. It is, therefore, not advisable to perform continually and exclusively the gymnastic exercises recommended in certain cases, but now and then to vary them with some less essential movements, which still have an indirect effect. It is, of course, proper to have a certain object in view, and to employ corresponding movements, but the rest of the muscular system ought not to be neglected. In a complex machine every wheel works better when all the parts are working together. This maxim holds still more true with the human organism, where every single part is in close and wonderful combination with the rest, and all act in powerful and harmonious concord.

To facilitate the carrying-out of the instructions, we consider it to the purpose to state of each single movement how many times it has to be repeated, whereby it will be seen that the alteration in the number of exercises is based upon special reasons.

The letter I added to some of the movements signifies the most suitable moment for profound inhalings of the breath, as indicated on pages 3 and 7, which should be repeated 6 or 8 times. These inhalings ought never to be omitted.

With regard to instructions having a special, local, curable aim, in which some of the most essential movements are repeated (as Nos. 1, 4, 5, and 6), it is advisable to omit the repetitions at first, until the

body, and particularly the active muscles, are accustomed to the new exercise, and in order to avoid over-exertion.

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1. Exercises for diverting blood-congestion and chronic pains from the head and chest:—

Turning of the arm (on its own axis), Fig. 16 (30, 40, 50 times).
Movements like the figure ∞, Fig. 17 (20, 30, 40 times).
I. Finger-stretching and spreading, Fig. 18 (12, 16, 20 times).
Describing a circle with the legs, Fig. 25 (4, 6, 8 times).
Raising the legs sideward, Fig. 26 (6, 10, 16 times). Not to be performed by women.
Turning the leg (on its axis), Fig. 27 (40, 50, 60 times).
Rubbing the hands, Fig. 19 (40, 60, 80 times). With indicated modifications.
I. Drawing together of the legs, Fig. 28 (6, 12, 16 times).
Knee-bending and stretching forward, Fig. 29 (6, 8, 10 times).
Do. do. backward, Fig. 30 (10, 12, 16 times).
Bending and stretching the foot, Fig. 31 (30, 50, 60 times).
I. Squatting on the ground, Fig. 33 (8, 16, 24 times).
Leg-movement forward and backward, Fig. 42 (8, 16, 24 times).
Do. sideward, Fig. 43 (8, 16, 24 times).
I. Trotting on the spot, Fig. 41 (100, 300, 500 times).
Squatting on the ground, Fig. 33 (8, 16, 24 times).

In cases where, contrary to expectation, no result is obtained by these exercises—for example, not being able to divert the blood, &c., from the head by producing warm feet—it is advisable to have recourse to a simple remedy, that of beating the foot-soles with a short thick stick, or piece of wood. The foot-soles are beaten in turn, outside the shoe of course, until an agreeable heat is felt. It is the most powerful remedy for obstinate cold feet, and it is never at fault.

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2. Exercises for strengthening and improving the respiration, for a narrow chest-cavity, symptoms of lung-tubercles, asthma, &c., likewise for strengthening the voice (in preachers and singers, and for stammering, &c.):—

Lifting of the shoulder, Fig. 3 (30, 40, 50 times).
Arm-swinging in a circle, Fig. 4 (8, 12, 20 times).
I. Do. sideward, Fig. 5 (10, 24, 40 times).
Elbows backward, Fig. 6 (8, 12, 16 times).
I. Hands folded on the back, Fig. 7 (8, 12, 16 times).
Arm-stretching sideward, Fig. 10 (10, 20, 30 times).
I. Do. upward, Fig. 11 (4, 8, 12 times).

Bending of the body sideward, Fig. 21 (10, 16, 24 times).
I. The stretched arms brought forward, Fig. 15 (12, 16, 24 times).
Turning the body in a circle, Fig. 23 (6, 10, 16 times).
I. Stick-movements with the arms, Fig. 34 (8, 20, 30 times).

In all cases where the respiration is irregular—*i.e.*, not alike on both sides of the chest—the usual deep inhalings are to be replaced by those mentioned on page 27, Fig. 8.

In asthma caused by sluggishness and enlargement of the lung-cells, easily discovered by the stethoscope, the stress is laid on the breathing forth, and not on the inhalings. Consequently, in all these cases any action combined with powerful breathing is to be recommended, as, for instance, loud speaking, reciting, laughing, and singing (particularly portamento singing). Persons who for some time have been suffering from chest-disease ought not to practise these things without consulting a medical adviser.

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3. Exercises for relieving sluggishness and inability of the functions of the abdominal organs, and for all diseases arising therefrom, especially in the portal-vein system, weakness of the digestive organs, costiveness and constipation, and the attending ailments, as headache, piles, hypochondria, hysteria, melancholy, &c.:—

Bending of the body forward and backward, Fig. 20 (10, 20, 30 times).
Bending of the body sideward, Fig. 21 (20, 30, 40 times).
I. Stick exercise with the arms, Fig. 34 (4, 12, 16 times).
Turning of the body on its own axis, Fig. 22 (8, 16, 24 times).
Bending of the knee and leg stretched forward, Fig. 29 (4, 6, 8 times).
I. Turning of the body in a circle, Fig. 23 (8, 16, 30 times).
* Sawing exercises, Fig. 38 (10, 20, 30 times).
Bending of the body upward, Fig. 24 (4, 8, 12 times).
Raising of the legs sideward, Fig. 26 (6, 10, 16 times). Omitted by ladies.
* Woodcutter exercises, Fig. 40 (6, 8, 12 times). Omitted by ladies).
Swinging of the arms forward and backward, Fig. 36 (20, 40, 60 times).
* Lifting of the knee in front, Fig. 32 (4, 10, 16 times).
I. Swinging of the arms sideward, Fig. 37 (30, 60, 100 times).
* Stick exercise with the legs, Fig. 44 (4, 6, 8 times). Omitted by ladies.
Trotting on the spot, Fig. 41 (100, 150, 200 times).

Persons who simultaneously use fomenting baths must only perform half the number of the exercises, and even less, of those marked with an asterisk.

To knead the abdomen is a very active means of promoting the functions of the abdominal organs: it should be performed in the morning in bed. Any straining of the stomach-muscles is to be avoided; the body should be placed on the back in a comfortable position. The thumbs being placed close under the ribs on the back side, and the rest of the outstretched fingers on the place of the stomach, a pressure is exercised by each hand in turn for some minutes. The effect is still more powerful when the pressure is combined with a jerk—that is, when the palms of both hands are pressed on the abdomen and then suddenly removed, producing a quick rebound of the elastic stomach-wall. A more powerful effect still is produced by kneading the abdomen with the fists for some minutes. In derangements of the abdomen, free from inflammation, as colic, flatulence, &c., a simple rubbing of the abdomen with the palm of the hand, especially when performed in a circle round the navel for five or ten minutes, is sufficient to allay the pain, and, when regularly carried out, to remove sluggishness in those organs. Deep inhalings of the breath are likewise to be recommended to those who suffer from a too slow circulation of the blood in the portal-vein system. The position in bed deserves likewise to be well considered, especially by those who suffer from chronic abdominal diseases. The best position is on the back, when the respiration is more easy and free: the organs of the abdomen are less exposed to pressure, and the body is not so easily curved as when it is resting on the side. When the organs in the sides, as the liver and spleen, are affected, it is necessary, in the first case, to avoid the position of the right side, and in the latter, that of the left side. Those who suffer from ailments in the abdomen ought to avoid the habit of crossing their legs or feet, when their occupation necessitates a sedentary position for some length of time.

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4. Exercises for promoting a motion:—

Swinging the arms backward and forward, Fig. 36 (20, 40, 60 times).
I. Swinging the arms sideward, Fig. 37 (20, 40, 60 times).
Bending the body upward, Fig 24 (4, 8, 12 times).
Sawing movements, Fig. 38 (10, 20, 30 times).
Turning the body in a circle, Fig. 23 (8, 12, 16 times).
I. Woodcutter exercises, Fig. 40 (6, 8, 12 times). Not to be practised by ladies.
Lifting the knees in front, Fig. 32 (6, 12, 20 times).
Swinging the arms backward and forward, Fig. 36 (30, 60, 100 times).
Swinging the arms sideward, Fig. 37 (30, 60, 100 times).
Trotting on the spot, Fig. 41 (100, 200, 300 times).
Turning the body in a circle, Fig. 23 (8, 16, 30 times, with the modification indicated).

When the motion is too costive and dry, a common injection of lukewarm water is the most innocent, the quickest, and most advisable remedy; in cases of piles, a small quantity of mild oil (as sweet oil) may be added.

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5. Exercises to reopen checked piles and menses:—

Mowing exercises, Fig. 39 (6, 10, 16 times).
Swinging the arms forward and backward, Fig. 36 (20, 30, 50 times).
Arm-movement downward, Fig. 12 (10, 20, 30 times). If the head will allow it, this movement may be done with a jerk.
I. Trotting on the spot, Fig. 41 (100, 150, 200 times).
Sawing exercise, Fig. 38 (10, 20, 30 times).
Lifting the knee in front, Fig. 32 (4, 8, 12 times).
Swinging the arms sideward, Fig. 37 (20, 30, 50 times).
Stick exercise with the leg, Fig. 44 (4, 6, 8 times). Not to be practised by ladies.
Swinging the legs sideward, Fig. 43 (8, 16, 24, times).
Lifting the knee in front, Fig. 32 (4, 8, 12 times).
Trotting on the spot, Fig. 41 (150, 200, 300 times).
Stick exercise with the legs, as above, Fig. 44 (4, 6, 8 times).

The expression "hæmorrhoids" is commonly used with a very undefined and too extensive a conception. It is necessary to divide them into two different classes. 1. When the blood vessels in the pelvis and around the rectum, in consequence of the erect position of the body, are over-charged with blood, producing a slower circulation or checking it, piles, itching in the rectum, and bleeding are the result. 2. When the checking of the blood-veins of the abdomen produces disorder in the functions of other organs, as the liver, spleen, heart, lungs, &c.

In the first case, the disproportion is generally removed by voluntary bleeding, and the complaint disappears; only when this is not the case, and when other organs are suffering, are the exercises of any benefit.

The menses may be treated in a similar manner, because the gymnastic exercises must only be practised when it is positive that the other ailments are based on the non-appearance of the menses; which may have its origin in want of blood (anæmia, chlorosis). In this instance, it would be wrong to force the flood of blood by gymnastics. The exercises No. 9B are, on the contrary, a suitable remedy against a too profuse, a too early, or a too late appearance of the menses (by diverting the blood-consumption to the muscles).

In inflamed hæmorrhoids, or in a too severe effusion of the blood, no gymnastic exercise will render any assistance, nor in too profuse menses. On the contrary, rest is an essential necessity.

6. Exercises to remove frequent and injurious pollution:—

Swinging the arms in a circle, Fig. 4 (8, 12, 20 times).
Raising the arms sideward, Fig. 5 (10, 20, 30 times.)
The elbows backward, Fig. 6 (8, 12, 16 times).
Arm-movements forward, Fig. 9 (10, 20, 30 times).
Do. sideward, Fig. 10 (10, 20, 30 times).
I. Do. upward, Fig. 11 (4, 8, 12 times).
Woodcutter movements, Fig. 40 (6, 12, 20 times). The stress is laid on the raising of the body.
Sawing movements, Fig. 38 (10, 20, 30 times).
Stretching the arms sideward, Fig. 14 (8, 12, 16 times).
Do. do. forward, Fig. 15 (8, 12, 16 times).
Squatting on the ground, Fig. 33 (8, 16, 24 times).
I. Mowing movements, Fig. 39 (8, 16, 24 times).
Rubbing the hands, Fig. 19 (40, 60, 80 times).
Woodcutter movements, Fig. 40 (6, 12, 20 times, as above).
Swinging the legs sideward, Fig. 37 (30, 60, 100 times).
I. Saw movements, Fig. 38 (10, 20, 30 times).

In obstinate cases of this kind, a sitting bath before bed-time (some time after the exercise, which ought never to be performed after supper), of from 50 to 54 degrees Fahr. for about 6 or 8 minutes, is to be recommended, or a water-injection of the same temperature, which is to be kept inside as long a time as possible, consequently only a small one; and in the night, to rest on the side in preference to the back.

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7. Exercises to cure hernia in the abdomen and inguinal hernia:—

Bending the body forward and backward, Fig. 20 (10, 20, 30 times).
Stretching the arms backward, Fig. 13 (8, 12, 20 times).
Bending the body upward, Fig. 24 (6, 10, 16 times).
Mowing exercises, Fig. 39 (8, 12, 20 times).
Turning the body on its own axis, Fig. 22 (10, 20, 30 times).
Swinging the arms backward and forward, Fig. 36 (30, 60, 100 times).

Bending the body upward, sideward, the position is the same as Fig. 24, with this difference, that the upper body is raised an eighth part of a turning, but sideward,* 4, 6, 8 times to each side. This movement will hardly be attainable before the performer has succeeded with the upward movement.

* When the body is placed on the back, as indicated, it performs half a turning to the side, and is then raised until it has gained an upright position. Hereby are those muscles specially affected which, by their contraction, assist to keep the hernia within.

The following rules claim particular attention:—1. The exercise ought never to be tried before the medical adviser has given his opinion as to the nature of the hernia, and his permission has been obtained. 2. During the exercise a truss is required, to keep the hernia completely within the abdomen; if the hernia cannot entirely be kept within, the exercise ought never to be attempted. 3. It is necessary to perform the exercise quietly and evenly, without shock or spasm. 4. The movement to be made on both sides, even if the hernia shows itself on one side only, as the other side frequently shows an inclination in the same direction; the muscles on both sides ought, therefore, to be strengthened. 5. The exercise to be continued without interruption for a period of 6 to 8 months. 6. After a lapse of 3 months, it may be repeated twice a day. 7. Children and adults are nearly always cured. 8. When the result turns out successful, the exercise ought, at least, to be repeated twice a week, to prevent a relapse. It has altogether a beneficial effect upon the health. When successful, the truss may by-and-by be left off. 9. Femoral hernia, which rarely appears, cannot be cured by this exercise.

8. Exercises to remove symptoms of stiffness:—

It is not to be expected that we are going to give a description of the numberless forms of stiffness which may arise in the various parts of the body where muscles exist, or to explain their origin. We believe it to be sufficient to indicate gymnastic exercises for two kinds of stiffness —viz., in the arm-muscles and in the muscles in the lower extremities. Where single muscles only or a division of muscles are suffering, the gymnastic cure ought to be arranged in such a manner that the prescribed movements for bringing the affected muscles into play are, by-and-by, repeated 3 or 4 times more than otherwise indicated, of course at the expense of other suitable movements. The same proceeding is to be observed in stiffness in one side, when the exercises are performed more frequently on the affected than on the healthy side.

In every kind of gymnastics to relieve stiffness, the principal object is to perform the exercises with uninterrupted attention and with strength of will, on which depends, to a large extent, how far, and with what degree of energy, the nervous power affects the muscles. In cases of stiffness where the force of the will is already impotent, or a complete immobility exists, some passive movements (by the assistance of another person) may be attempted, if possible, to prepare for a transition to more active exercises.

The entire gymnastic for relieving stiffness may essentially be assisted by certain mechanical manipulations, as, in the most handy way, to rub, knead, and beat (with the edge of the hand), or powerfully to rub (with the out-stretched finger-tips), or to glide evenly

over (with the palm of the hand), the affected muscles. The last-named manipulation ought always to be made in the direction of the blood-circulation, towards the heart. It answers the purpose best to perform the manipulations immediately before the exercises, and by the aroused and revived influence, to assist the active movements, and even to make them practicable. They may be repeated several times daily, but not carried out to such an extent as to give rise to pain.

A. To relieve symptoms of stiffness in the arms:—

Raising the shoulders, Fig. 3 (30, 40, 50 times).
Swinging the arms in a circle, Fig. 4 (8, 12, 20 times).
I. Raising the arms sideward, Fig. 5 (10, 20, 30 times).
The elbows backward, Fig. 6 (8, 12, 16 times).
The hands folded on the back, Fig. 7 (8, 12, 16 times).
Sawing movements, Fig. 38 (10, 20, 30 times).
Arm-movements forward, Fig. 9 (10, 20, 30 times).
Do. outward, Fig. 10 (10, 20, 30 times).
Do. upward, Fig. 11 (4, 8, 12 times).
Do. downward, Fig. 12 (10, 20, 30 times).
I. Do. backward, Fig. 13 (6, 10, 16 times).
Turning the leg on its own axis, Fig. 16 (30, 40, 50 times).
Imitating the number ∞, Fig. 17 (20, 30, 40 times).
Spreading and stretching the fingers, Fig. 18 (16, 24, 40 times).
I. Rubbing the hands, Fig. 19 (50, 80, 100 times).

B. To relieve symptoms of stiffness in the legs:—

Swinging the legs in a circle, Fig. 25 (4, 6, 8 times).
Raising the legs sideward, Fig. 26 (6, 10, 16 times). Not for ladies.
* Turning the leg on its own axis, Fig. 27 (20, 30, 40 times).
I. Drawing together of the legs, Fig. 28 (4, 6, 8 times).
* Bending the knee and stretching forward, Fig. 29 (6, 8, 10 times).
Bending the knee and stretching backward, Fig. 30 (10, 12, 16 times).
Bending and stretching the foot, Fig. 31 (20, 40, 60 times).
I. Squatting on the ground, Fig. 33 (8, 12, 24 times).
Bending the body upward, Fig. 24 (4, 6, 8 times).
Mowing movements, Fig. 39 (10, 20, 30 times).
Woodcutter movements, Fig. 40 (8, 16, 24 times). The stress here is laid on the backward bending of the body. Not for ladies.
Trotting on the spot, Fig. 41 (100, 200, 300 times).
Swinging the legs forward and backward, Fig. 42 (8, 16, 24 times).
* Do. do. sideward, Fig. 43 (8, 16, 24 times).

In default of firmness in the legs, the exercises marked * may be performed in a resting position, the legs slightly raised.

We recommend all who suffer from stiffness at the beginning to distribute the exercises over various periods of the day, with shorter or longer pauses, according to disposition. All over-exertion to be avoided, as also a too powerful irration of the active nerves and muscles. This is best secured by the pauses in the exercises, and partly by a quiet and even execution of the movements.

9. Exercises to be practised in cases where no positive local ailment exists, but in which there is a deficiency in the whole constitution, or in the construction of the body:—

The main point here is the general health and good, sound exercise. Consequently, they are of value in cases of general weakness of the muscle or nervous system, poverty of the blood, affected glands, gout, adipose disease, &c., and they are also beneficial to all who have insufficient exercise.

A. For male adults:—

All the following movements will occupy about half an hour, and produce the same effect as a walk of four or five hours, but will be less fatiguing, in consequence of the great variation in the activity of the muscles; much time is hereby gained. To break the monotony and weariness, it may be advisable to perform the exercises in company.

Swinging the arms in a circle, Fig. 4 (8, 12, 20 times).
Arm-movements forward, Fig. 9 (10, 20, 30 times).
Do. outward, Fig. 10 (10, 20, 30 times).
I. Do. upward, Fig. 11 (4, 8, 12 times).
Turning the body in a circle, Fig. 23 (8, 16, 30 times).
Rubbing the hands, Fig. 19 (40, 60, 80 times).
Bending the body upward, Fig. 24 (4, 8, 12 times).
I. Raising the legs sideward, Fig. 26 (6, 10, 16 times).
Drawing together the legs, Fig. 28 (4, 6, 8 times).
Bending and stretching of the foot, Fig. 31 (20, 30, 40 times).
Sawing movements, Fig. 38 (10, 20, 30 times).
I. Lifting the knee in front, Fig. 32 (4, 8, 12 times).
Swinging the arms forward and backward, Fig. 36 (30, 60, 100 times).
Squatting on the ground, Fig. 33 (8, 16, 24 times).
I. Swinging the arms sideward, Fig. 37 (30, 60, 100 times).
Woodcutter movements, Fig. 40 (6, 12, 20 times).

Trotting on the spot, Fig. 41 (100, 200, 300 times).
I. Mowing movements, Fig. 39 (8, 16, 24 times).
Swinging the legs forward and backward, Fig. 42 (8, 16, 24 times).
Do. do. sideward, Fig. 43 (8, 16, 24 times).

B. For ladies:—

A regular and methodical muscle-activity is decidedly necessary at the age of stoppage of the menses. It may assist in counteracting numerous wants and defects in the general mode of living, and prevent many sufferings and dangers very common at the time of this transition, and may aid in attaining a happy old age.

Swinging the arms in a circle, Fig. 4 (4, 6, 10 times).
Do. do. sideward, Fig. 5 (5, 10, 15 times).
Hands folded on the back, Fig. 7 (4, 6, 8 times).
* Bending the body forward and backward, Fig. 20 (5, 10, 15 times).
Arm-movements forward, Fig. 9 (5, 10, 15 times).
Arm-swinging outward, Fig. 10 (5, 10, 15 times).
* Bending the body sideward, Fig. 21 (10, 15, 20 times).
Swinging the arms forward and backward. Fig. 36 (15, 30, 50 times).
Bending and stretching the knee forward, Fig. 29 (3, 4, 5 times).
Do. do. backward, Fig. 30 (5, 6, 8 times).
* Turning the body on its own axis, Fig. 22 (5, 10, 15 times).
* Sawing movements, Fig. 38 (5, 10, 15 times).
* Drawing together the legs, Fig. 28 (2, 3, 4 times).
Swinging the arms sideward, Fig. 37 (15, 30, 50 times).
I. Bending and stretching the foot, Fig. 31 (10, 15, 20 times).
* Mowing movements, Fig. 39 (4, 8, 12 times).
* Squatting on the ground, Fig. 33 (4, 8, 12 times).

The movements marked with an asterisk must not be performed during the menses.

C. For both sexes above 60 years of age:—

It is an erroneous supposition that aged people require as much rest as possible. It is quite true that they ought not to expose themselves to fatigue to the same extent as the vigorous adult: they require, no doubt, more rest, and of longer duration, but general exercise and regular movements are absolutely necessary to check infirmities attending upon old age, and to assist in prolonging life. Sometimes an increase of the gymnastic exercise is necessary, as even to double the number of the exercises once a week. The purpose of gymnastics is to invigorate, and they are more needful for old people, who, at this time of life, frequently give in to weariness and indolence, which for the most part check the functions of life, and

suspend them ultimately. Experience speaks in favour of this argument.

Swinging the arms in a circle, Fig. 4 (4, 6, 10 times).
Swinging the legs in a circle, Fig. 25 (2, 3, 4 times).
I. Stretching the arms sideward, Fig. 14 (4, 6, 8 times).
I. Do. do. forward, Fig. 18 (4, 6, 8 times).
Bending the body forward and backward, Fig. 20 (5, 10, 15 times).
Rubbing the hands, Fig. 19 (20, 30, 40 times).
I. Turning the legs, Fig. 27 (10, 15, 20 times).
Arm-movements outward, Fig. 10 (5, 10, 15 times).
Do. downward, Fig. 12 (5, 10, 15 times).
I. Do. backward, Fig. 13 (3, 5, 8 times).
Squatting on the ground, Fig. 33 (4, 8, 12 times).
Swinging the arms forward and backward, Fig. 36 (15, 30, 50 times).
I. Bending the body sideward, Fig. 21 (10, 15, 20 times).
Sawing movements, Fig. 38 (5, 10, 15 times).
Swinging the arms sideward, Fig. 37 (15, 30, 50 times).
I. Trotting on the spot, Fig. 41 (50, 100, 150 times).

To preserve uninterrupted good health, bodily strength, and endurance, we recommend the following rules:—In a satisfactory state of health, it ought to be made a rule every day (in more advanced age, two or three times weekly) to wash and rub the body at a temperature of 57 deg. Fahr. The most suitable time is immediately after getting out of bed, while standing in a bath having about an inch of water, 54 to 62 deg. Fahr. The body is then well rubbed, the head first, with a coarse piece of flannel, steeped in water and slightly wrung. When the body is well dried, it is thoroughly kneaded, and to the more rigid parts (as the head and joints) a manipulation is applied. After dressing, the exercises are then performed. Experience will prove to what extent this practice contributes to revive and recreate the whole system at every stage of life, and will encourage the continuance of the practice.

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10. Exercises for children of both sexes to effect a normal development of the body:—

As a rule, children of four to five years of age may be considered ripe to commence a regular course of gymnastic exercise at home. It is specially recommended to schools and other educational institutions as a part of the educational course. If continued during the whole period of childhood, it will be sufficient to repeat it afterwards, on an average, twice a week. It will be well to select days when the body is deprived of ordinary exercise.

We avail ourselves of this opportunity to impress on all instructors of youth never to allow children to have more than two hours' uninterrupted mental application. In the present system of instruction the development of the body must be well considered, its carriage and general health. To continue long in a sedentary position without change, and until the back is tired, is frequently the cause of distortion of the spine, which has great significance for the future of young ladies. An uninterrupted mental occupation for children is in like manner fatiguing. The usual rest of ten minutes or a quarter of an hour in schools is not sufficient to make amends for the above inconveniences. We believe, therefore, that school-teachers ought to allow children, during the play-time, to perform these exercises, either in the school-room or in the playground. Every teacher will, even without knowledge of gymnastics, be able to superintend, so that the children perform the exercises in a proper and regular manner. This invigorating and recreating practice will enable the children to recommence their studies with renewed strength and courage. The body is, after all, the foundation of the mental development, and ought, therefore, to be studied at schools as one of the most essential problems.

A grown-up person ought to be present, to see that the children perform the exercises properly. Children, as a rule, do not possess the necessary seriousness, and the subject may easily be abused, and the intended effect lost. It ought to be a point of education to rouse the children to a proper sense of the value of gymnastics, and to encourage them to persevere in them (especially by a suitable variation and emulation), as they are only beneficial when performed with a good-will. Particular attention must be paid to the manner in which the exercises are performed, that the children do not employ more muscular strength, or repeat the movements more frequently on one side than the other, as nearly all are inclined to spare the weaker (left) side, even unknowingly. It is particularly this deficiency in the development which is of great significance to children, who, while growing, are to a great extent exposed to deformities and anomalies by the later development of the body.

When a complete development of the body is aimed at—that is to say, the obtaining, as far as possible, of a complete power of the mind over the body—as, for example, in dancing, military training, &c.—the point is easier gained when the exercises are performed in company of two, three, or more.

If sensibly managed, the exercises may be performed with infinite variation, but always with calmness and regularity.

Those marked with a * must not be performed by young girls.

Turning the head in a circle, Fig. 1 (5, 10, 15 times).
Do. do. sideward, Fig. 2 (3, 4, 5 times).
Swinging the arms in a circle, Fig. 4 (4, 6, 10 times).
Lifting the arms sideward, Fig. 5 (5, 10, 15 times).
The elbows backward, Fig. 6 (4, 6, 8 times).
I. The hands crossed on the back, Fig. 7 (4, 6, 8 times).

Arm movements forward, Fig. 9 (5, 10, 15 times).
Do. outward, Fig. 10 (5, 10, 15 times).
Do. upward, Fig. 11 (2, 4, 6 times).
Do. downward, Fig. 12 (5, 10, 15 times).
I. Do. backward, Fig. 13 (3, 5, 8 times).
Swinging the legs in a circle, Fig. 25 (2, 3, 4 times).
* Raising the legs sideward, Fig. 26 (3, 5, 8 times).
Stretching the arms sideward, Fig. 14 (4, 6, 8 times).
I. Do. do. forward, Fig. 15 (4, 6, 8 times).
Bending the body forward and backward. Fig. 20 (5, 10, 15 times).
Bending the body sideward, Fig. 21 (10, 15, 20 times).
Turning the arm on its own axis, Fig. 16 (15, 20, 25 times).
Imitation of figure ∞, Fig. 17 (10, 15, 20 times).
Stretching and spreading the fingers, Fig. 18 (6, 8, 10 times).
Turning the leg on its own axis, Fig. 27 (10, 15, 20 times).
I. Drawing together the legs, Fig. 28 (2, 3, 4 times).
Turning the body on its own axis, Fig. 22 (5, 10, 15 times).
Bending the knee and stretching forward, Fig. 29 (3, 4, 5 times).
Do. do. do. backward, Fig. 30 (5, 6, 8 times).
Bending and stretching the foot, Fig. 31 (10, 15, 20 times).
I. Raising the knee in front, Fig. 32 (2, 4, 6 times).
I. Bending the body upward, Fig. 24 (2, 4, 6 times).
Mowing movements, Fig. 39 (4, 8, 12 times).
* Woodcutter movements, Fig. 40 (3, 6, 10 times).
Squatting on the ground, Fig. 33 (4, 8, 12 times).
Stick movements with the arms, Fig. 34 (2, 6, 8 times).
Walking with stick under the arms, Fig. 35, in 5, 8, or 10 minutes.

As the growing body does not possess the same strength of muscles and power of endurance as ripe age, and wants more rest after fatiguing exertions, children ought to rest, stretched on their back, for a quarter of an hour after performing the gymnastic exercises. When a child has been sitting upright in school for some time, the above-mentioned rest is necessary, especially for the benefit of its growth and carriage. If, after a sedentary occupation of some hours, a suitable rest be allowed (at least the back supported), the child will then be able to occupy its former position. If this rest be refused, an impossibility is required of the child, and the attempt will punish itself.

11. Exercises which may be performed sitting or lying down, especially for cripples and deformed people, who have to select the most suitable exercises:—

The letter L (lying down) and the letter S (sitting) is placed after each exercise, to indicate the position in which it may be carried out.

Turning the head in a circle, Fig. 1 (10, 20, 30 times). S.
Do. do. sideward, Fig. 2 (6, 8, 10 times). S.
Lifting the shoulders, Fig. 3 (30, 40, 50 times). S.
Swinging the arms in a circle, Fig. 4 (8, 12, 20 times). S.
Raising the arms sideward, Fig. 5 (10, 20, 30 times). S.
The elbows backward, Fig. 6 (8, 12, 16 times). S.
Profound inhalings, see page 18, Fig. 8.
Arm movements forward, Fig. 9 (10, 20, 30 times). S and L.
Do. outward, Fig. 10 (10, 20, 30 times). S. and L.
Do. upward, Fig. 11 (4, 8, 12 times), S.
Stretching the arms sideward, Fig. 14 (8, 12, 16 times). S and L.
Do. do. forward, Fig. 15 (8, 12, 16 times). S and L.
Turning the arm on its own axis, Fig. 16 (30, 40, 50 times). S and L.
Imitation of number ∞, Fig. 17 (20, 30, 40 times). S and L.
Stretching and spreading the fingers, Fig. 18 (12, 16, 20 times). S and L.
Rubbing the hands, Fig. 19 (40, 60, 80 times). S and L.
Bending the body forward and backward, Fig. 20 (10, 20, 30 times). S.
Bending the body sideward, Fig. 21 (20, 30, 40 times). S.
Turning the body on its own axis, Fig. 22 (20, 30, 40 times). S. and L.
Raising the body, Fig. 24 (4, 8, 12 times). L.
Turning the leg on its own axis, Fig. 27 (20, 30, 40 times, with slightly raised leg). S and L.
Drawing together the legs, Fig. 28 (4, 6, 8 times, the legs properly raised). S. and L.
Stretching and bending the knees forward, Fig. 29 (6, 8, 10 times). S with straight-stretched leg, L the leg only raised a few inches from the ground.
Bending and stretching the feet, Fig. 31 (20, 30, 40 times, with slightly raised leg). S and L.
Stick movements with the arms, Fig. 34 (4, 12, 16 times). S.
Sawing movements, Fig. 38 (10, 20, 30 times). S.
Swinging the legs sideward, Fig. 43 (8, 16, 26 times, with slightly raised leg). L.
Rolling on the back, Fig. 45 (30, 40, 50 times). L.

To be able correctly to estimate the result of the exercises carried out in a sitting position, it must be borne in mind that the effect produced when in a standing position on the muscles of the back, legs, and feet, is then, more or less, lost.

Besides the various cases before described in which home-gymnastics may be used with beneficial effect, we may mention several important and acceptable subordinate advantages: for example, refreshing and sound sleep, an improved appetite, a certain lively cheerfulness (like to the feeling of satisfaction attending upon a good action), the change of seasons and temperature more easily endured,

also less susceptibility to epidemic diseases, and to other unfavourable physical and moral potencies; a better control of the body, an increased capacity for mental and bodily labour, and a greater endurance in the employment of the physical strength is thereby gained; shortness of breath is, to a certain extent, prevented; greater facility for mental labour is obtained, and the consequences of indulgence in luxurious suppers and other mistaken dietary are rendered less fatal. The practice of gymnastics proves, for the most part, what the body is still able to perform, and whether any part of its strength has been lost, and if so, an attempt in good time ought to be made to remedy that loss. The medical adviser or the sensible layman, by availing himself in a proper manner of these directions, will find in them an ample source from which he may, on many occasions, derive assistance in attaining a successful result. He will also find them the most simple and the most natural regulator of the organic machinery of life.

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